AMENDMENTS TO THE CLAIMS

The following is a complete listing of the claims indicating the current status of each claim and including amendments currently entered as highlighted.

1-38. (Canceled)

39. (New) An automatic fire sprinkler device comprising:

a self-adjusting orifice associated with an automatic fire sprinkler,

said automatic fire sprinkler having:

a sprinkler housing defining a water inlet and a water outlet;

a plug mechanism, attached to said sprinkler housing, and responsive to a thermally sensitive element,

wherein said automatic fire sprinkler is adapted such that when said sprinkler is connected to an automatic fire sprinkler system, and when said sprinkler is in a standby configuration, a plug of said plug mechanism seals said housing so as to prevent a stream of water from discharging from said automatic fire sprinkler via said water outlet,

and wherein said automatic fire sprinkler is further adapted such that when said sprinkler is connected to the fire sprinkler system, and when a temperature of said thermally sensitive element reaches a particular value, said plug is displaced with respect to said housing to achieve an activated configuration, in which:

(i) said water inlet fluidly communicates with a water flow-path of the automatic fire sprinkler system;

(ii) said stream of water passes through said water outlet and discharges from said automatic fire sprinkler, and

(iii) said orifice self-adjusts in direct response to a water pressure acting on said orifice, so as to provide, as a function of said water pressure, a plurality of different, open cross-sections for said stream of water to pass therethrough, such that each open cross-section of said open cross-sections uniquely corresponds to a particular, unique water pressure acting on said orifice.

40. (New) The automatic fire sprinkler device of claim 39, wherein, in said activated configuration, said orifice is adapted to self-adjust an open cross-section of said open cross-sections solely as a function of said water pressure acting on said orifice.

41. (New) The automatic fire sprinkler device of claim 39, wherein said orifice includes a flow-impeding element for impeding said stream of water, such that in said activated configuration, said flow-impeding element is directly responsive to said water pressure acting on said orifice.

42. (New) The automatic fire sprinkler device of claim 41, wherein, in said activated configuration, said flow-impeding element is self-adjusting, based on said water pressure, so as to decrease a cross-sectional area of said water flow-path as a function of a decrease in said water pressure, so as to maintain said orifice in an intermediately open position.

43. (New) The automatic fire sprinkler device of claim 39, wherein each open cross-section of said open cross-sections represents a stable, equilibrium cross-section uniquely corresponding to said unique water pressure.

44. (New) The automatic fire sprinkler device of claim 41, wherein said flow-impeding element is disposed within said automatic fire sprinkler.

45. (New) The automatic fire sprinkler device of claim 41, wherein said flow-impeding element is anchored to said automatic fire sprinkler.

46. (New) The automatic fire sprinkler device of claim 41, wherein said flow-impeding element is anchored to an inner wall of a deflector of said automatic fire sprinkler.

47. (New) The automatic fire sprinkler device of claim 41, wherein said flow-impeding element includes a damping mechanism, said damping mechanism responsive to said water pressure.

48. (New) The automatic fire sprinkler device of claim 39, wherein a flowrate of said water through said orifice is characterized by a formula:

$$Q = K*(p)^{1/2}$$

wherein Q is said flowrate,
p is said water pressure, and
K is a coefficient dependent upon a geometry of said sprinkler,
K further being a function of said pressure p, so as to provide said plurality of open cross-sections.

49 (New) The automatic fire sprinkler device of claim 44, wherein, in said activated configuration, said orifice is adapted to self-adjust an open cross-section of said open cross-sections solely as a function of said water pressure acting on said orifice.

50. (New) The automatic fire sprinkler device of claim 44, wherein said orifice includes a flow-impeding element for impeding said flow, such that in said activated configuration, said flow-impeding element is directly responsive to said water pressure acting on said orifice.

51. (New) The automatic fire sprinkler device of claim 44, wherein each open cross-section of said open cross-sections represents a stable, equilibrium cross-section uniquely corresponding to said unique water pressure.

52. (New) The automatic fire sprinkler device of claim 44, wherein a flowrate of said water through said orifice is characterized by a formula:

$$Q = K*(p)^{1/2}$$

wherein Q is said flowrate,
p is said water pressure, and
K is a coefficient dependent upon a geometry of said sprinkler,
K further being a function of said pressure p, so as to provide said plurality of open cross-sections.

53. (New) The automatic fire sprinkler device of claim 44, wherein said flow-impeding element includes a flexible diaphragm.

54. (New) The automatic fire sprinkler device of claim 53, said flow-impeding element further including a damping mechanism for damping movement of said diaphragm, said damping mechanism responsive to water pressure.

55. (New) The automatic fire sprinkler device of claim 54, wherein said damping mechanism includes a piston.

56. (New) The automatic fire sprinkler device of claim 54, wherein said damping mechanism includes a spring.

57. (New) The automatic fire sprinkler device of claim 41, wherein said flow-impeding element is operatively connected to said automatic fire protection system.

58. (New) The automatic fire sprinkler device of claim 57, wherein said flow-impeding element includes at least one leaf disposed within said water flow-path, said leaf configured so as to reduce said open cross-section as a function of a decreasing water pressure acting on said orifice.

59. (New) The automatic fire sprinkler device of claim 58, wherein said at least one leaf is a plurality of leaves.

60. (New) The automatic fire sprinkler device of claim 59, wherein said plurality of leaves shares a common base.

61. (New) The automatic fire sprinkler device of claim 59, wherein said leaves are radial segments, said plurality of leaves designed and configured to move from an open configuration towards a closed configuration as a decreasing function of said water pressure, so as to reduce said open cross-section as a function of a decreasing water pressure acting on said orifice.